

## Flexible and Safe Control of Mobile Surface Systems, Phase II

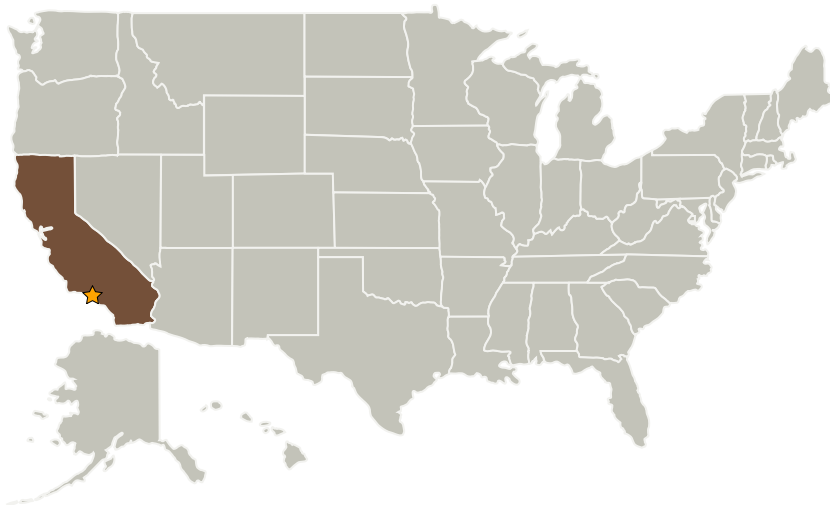
Completed Technology Project (2005 - 2007)



## Project Introduction

The primary innovation of this work is a novel approach for flexible and safe control of highly capable mobile surface systems, such as long-duration science rovers, crew surface systems, multi-robot and human-robot teams. The traditional approach of time-based sequence of commands will not be adequate for commanding and coordinating future mobile surface systems because it does not support concurrent tasks and team coordination. Those future systems will need more expressive executable plans, either uplinked from the ground or generated automatically onboard the spacecraft. The executive must ensure that the execution of commands and the response to the fault protection system conform to the pre-planned behavior. A new execution language, called PLEXIL, has been designed specifically for flexible and safe command execution. The language is portable, lightweight, predictable, and expressive. The Phase II effort will focus on the development of the PLEXIL Executive System and Plan Editor. While the role of the Executive is to interpret and execute task plans according to the syntax and semantics of the PLEXIL language and ensures reliable and safe plan execution, the Editor facilitates the creation and editing of PLEXIL task plans.

## Primary U.S. Work Locations and Key Partners



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## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission  
Directorate (STMD)

### Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

### Responsible Program:

Small Business Innovation  
Research/Small Business Tech  
Transfer

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Organizations Performing Work	Role	Type	Location
★ Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California
IA Tech, Inc.	Supporting Organization	Industry	Los Angeles, California

## Primary U.S. Work Locations

California

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

Carlos Torrez

## Technology Areas

### Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
  - └ TX11.1 Software Development, Engineering, and Integrity
  - └ TX11.1.7 Frameworks, Languages, Tools, and Standards